ASSESSMENT OF TORNADO DAMAGE AT THE OAK GROVE CEMETERY, AMERICUS, GEORGIA

CHICORA RESEARCH CONTRIBUTION 468

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ABSTRACT

The 150 year old Oak Grove Cemetery in Americus, Georgia was heavily damaged by the March 1, 2007 EF 3 tornado that traveled across Webster, Sumter, and Macon counties. We were requested by the National Trust of Historic Preservation and State Senator George Hooks (District 14), to conduct an assessment of the damage and provide recommendations for conservation treatments.

The cemetery is listed on the National Register of Historic Places and has even been awarded the Georgia Historic Trust's Excellence in Rehabilitation. As such all work in the cemetery should conform to the Secretary of the Interior's *Standards for Preservation*. Landscape restoration should conform to the Secretary of the Interior's *Standards for Reconstruction of Cultural Landscapes*.

In addition, we understand the City of Americus is seeking FEMA funding to assist with the extensive conservation treatments necessary in the cemetery. Citing FEMA 9524.6, *Collections and Individual Objects*, we note that the monuments in the historic core of the cemetery are clearly objects of exceptionally significant cultural value. This is documented by the cemetery's National Register status as well as our assessment of the variety, nature, and context of the markers.

We point out that FEMA requires all conservation work on such objects to be conducted to the American Institute for Conservation of Historic and Artistic Works (AIC) Standards of Practice and Code of Ethics. This requires that a trained conservator undertake the work.

Our report is divided into three sections. The first provides information concerning the assessment of the monuments. We provide some background to help the reader understand appropriate conservation techniques and the Secretary of the Interior's *Standards for Preservation.* We provide, as an appendix, treatment proposals for each of the monuments reviewed by this assessment. Such treatment proposals are required by the AIC Standards of Practice and Code of Ethics. They also provide the City with a cost estimate and a prioritization of the work.

The next section details work that is necessary to protect the archaeological resources present at the cemetery, as well as the techniques that should be followed in order to protect the monuments, the archaeological resources, and the landscape from additional damage.

The final section provides assistance in the restoration or reconstruction of the landscape. We provide recommendations on what plants to re-establish, as well as plants that should not be re-introduced to the cemetery landscape. We provide brief specifications for selecting plants, as well as planting trees. We also make specific recommendations concerning the use of International Society of Arboriculture (ISA) certified arborists for the work necessary in restoration pruning.

While the cemetery has sustained considerable damage, through carefully following our recommendations and conducting professional conservation treatments it will be possible to minimize that damage and begin the healing process at the cemetery. These recommendations will also serve to help ensure the continued listing of Oak Grove Cemetery on the National Register of Historic Places.

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INTRODUCTION

Chicora Foundation was contacted on March 7, 2006 by Ms. Nancy Tinker of the National Trust for Historic Preservation, asking if we would be willing to undertake an emergency assessment of the Americus, Georgia Oak Grove Cemetery.

This request for assistance was in response to a March 1 tornado that tracked across Webster, Sumter, and Macon counties, from Chambliss to about 17 miles northeast of Americus. The intensity rated was EF3 (severe). The path length was approximately 38 miles with a maximum width of 1 mile in Americus. The heaviest damage was in the city of Americus around the Sumter Regional Hospital. Wind speeds with an EF3 tornado are at least 158 miles per hour.

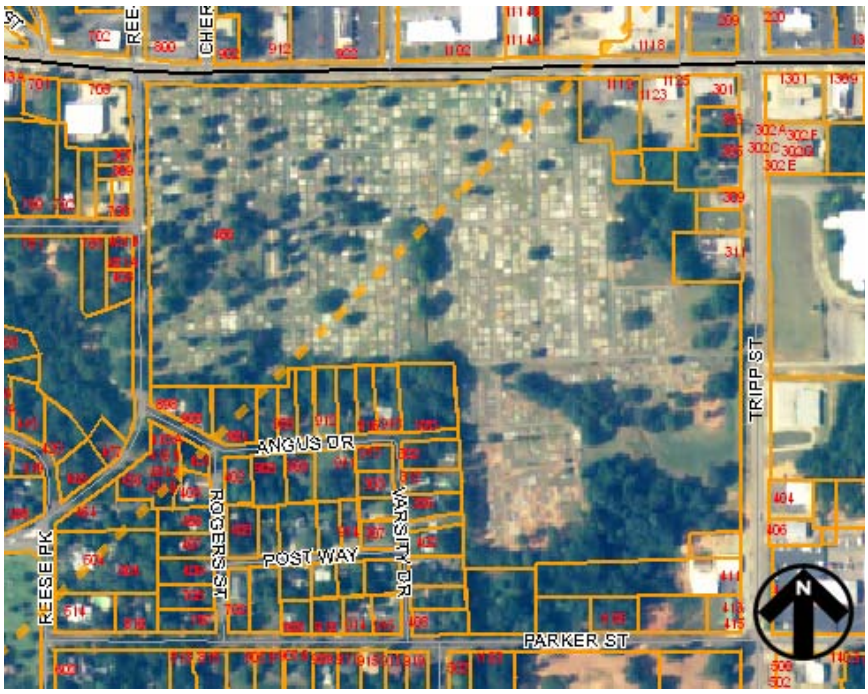

Figure 1. Storm track (dashed yellow line) across Oak Grove Cemetery, Americus, Georgia (courtesy Americus Sumter Disaster Portal, http://americus.binarybus.com/Disaster/).

The tornado tracked across Oak Grove cemetery, entering at the southwest corner, directly crossing a portion of the historic section, and exiting the cemetery at East Lamar Street (Figure 1). However, given the width of the storm, the entire cemetery was affected (Figures 2 and 3).

Chicora was able to respond to the request and two staff, Ms. Nicole Southerland and Ms. Julie Poppell, spent March 15 and 16 on-site assessing the damage. This work was focused on the historic core of the cemetery, situated at the western edge of the property.

This report provides a series of treatment proposals that outline the conservation needs of over 163 monuments and fences in the historic core of the cemetery. This is work that will require a stone and iron conservator, such as Chicora Foundation (we are members of the American Institute for Conservation of Historic and Artistic Works [AIC] and voluntarily subscribe to that organization's Standards of Practice and Code of Ethics).

The report also outlines recommendations concerning more immediate clean-up efforts, dealing with the issues of tree and stump removal, cut vegetation removal,

Figure 2. View of the cemetery, along center drive facing east.

infilling of stump holes, and compaction. We briefly discuss some of the archaeological issues associated with the damage and make recommendations concerning archaeological involvement in the restoration process.

Finally, the report also provides some brief recommendations concerning efforts to restore the landscape. While it will take time for the landscape vista to be restored, we make recommendations concerning the selection of replacement plants and also on how the restoration should take place.

We anticipate that this report will assist the City in seeking FEMA funds for the restoration of damage directly related to the effects of the tornado. It is our understanding that the cemetery, owned and operated by the City of Americus, is eligible for funding.

FEMA 9524.6, *Collections and Individual Objects*, specifically states that damaged collections and objects of exceptionally significant cultural value are eligible for FEMA assistance if the damage is the result of a major disaster event (which this is), the objects are located within the designated disaster area (they are), and the owner of the objects is an eligible application (the City is an eligible applicant). The FEMA guidance also stipulates that while funded work generally seeks to "stabilize" damaged objects, FEMA's Preservation Office will use "professional judgement to determine if additional treatment beyond stabilization is necessary to maintain the integrity of the collection or object and return it to its pre-disaster function." It is also specified

Figure 3. View of the cemetery.

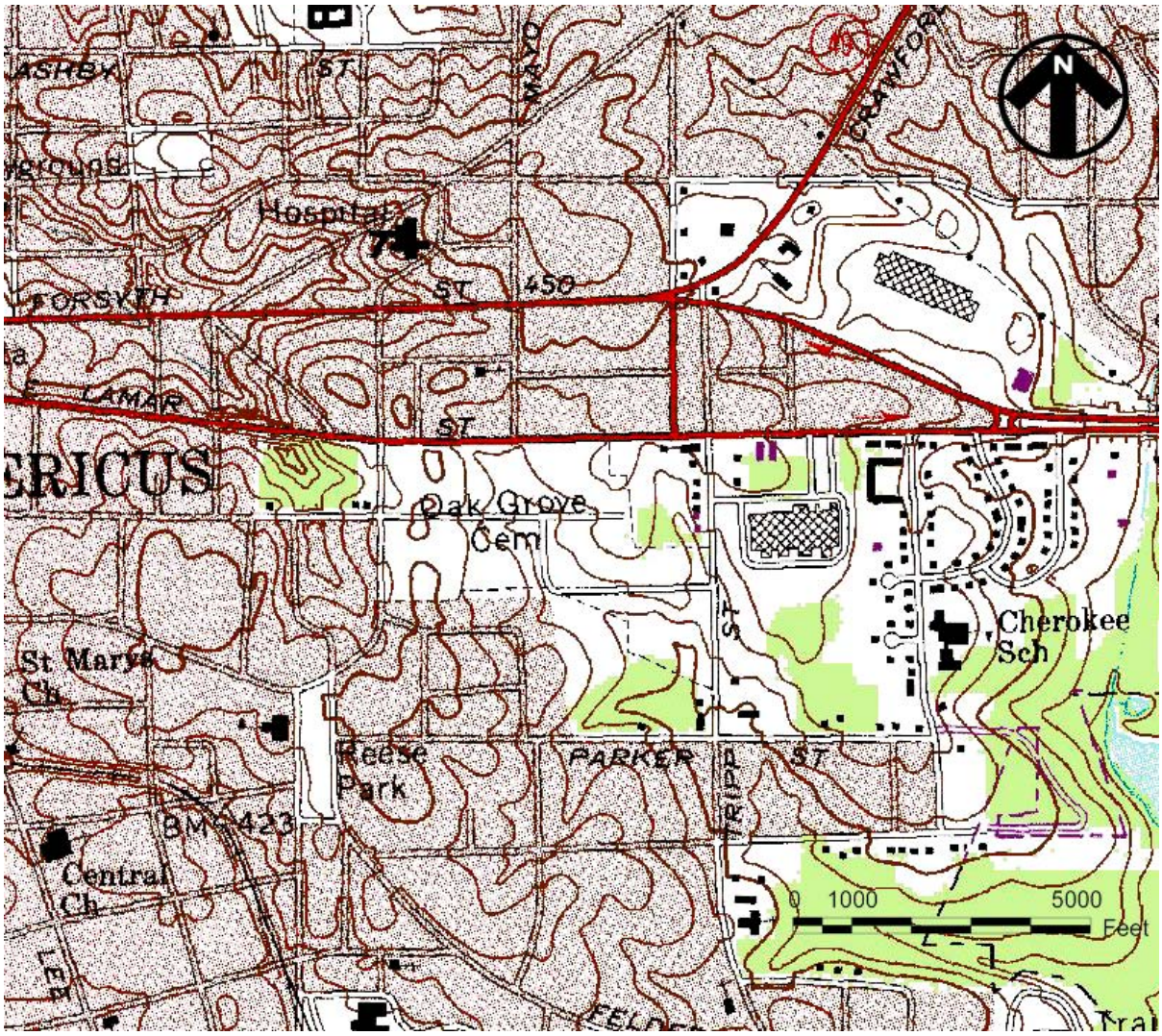

Figure 4. Portion of the Americus, Georgia USGS topographic map showing the vicinity of Oak Grove Cemetery.

that the work will be conducted to the AIC Standards of Practice and Code of Ethics.

As a result, our assessments and recommendations are conservative. For example, we do not recommend artistic restorations or replacements of damaged elements. Instead, we recommend the minimally accepted professional standard of conservation for damaged stone or ironwork. In addition, while we recommend substantial plant replacements, we do not suggest heroic efforts to replace historic vegetation using extremely large caliper plants.

Chicora Foundation draws upon its experience with the City of Albany, Georgia in the restoration of its cemetery in 2003 as a result of the 1994 Alberto storm – *another project which was FEMA funded*. We also base our recommendations on extensive cemetery preservation and conservation experience (see Appendix 1 for additional information). And, as required by FEMA, our recommendations and treatment proposals comply with AIC Standards of Practice.

The cemetery is situated on the east edge of the central downtown area. As shown in

Figures 1 and 4, it is bounded to the north by East Lamar Street (US 280 and GA 27), on the east by Tripp Street, on the south by tracts bordering Parker Street and Angus Drive, and on the west by Reese Street, which is the main entrance to the cemetery.

The city of Americus was founded in 1833 and quickly became a commercial center for southwestern Georgia. The cemetery is approximately 40.71 acres and was opened in 1856. The Sexton's Office was built in 1900. In 1976 the Americus Historic District was placed on the National Register of Historic Places and the district boundary was expanded in 1979 to include Oak Grove.

In 2001 Americus partnered with the Sumter Historic Trust and the Town Committee of the Colonial Dames to begin the restoration of the cemetery. The Sexton's office was restored in 2001, followed by work to restore the c. 1880 fish pool and garden. Work was conducted on nearly 300 graves and 26 fences. Landscape work included the addition of native plants and 136 camellia plants. The cemetery received an award of Excellence in Rehabilitation from the Georgia Historic Trust in April 2004.

STONE-BY-STONE ASSESSMENT

Introduction

As previously mentioned, this assessment was conducted by Ms. Nicole Southerland and Ms. Julie Poppell on March 15 and 16, under the direction of Dr. Michael Trinkley. The assessment focused on the western third of the cemetery – the area identified to us as the historic core.

At the time of our visit work had already begun on the removal of downed trees and this greatly facilitated our ability to move around the cemetery and between the individual stones. It also assisted us in being better able to identify problems and assess the damage.

For each stone notes were made and one or more digital photographs were taken, each including a scale and color bars. These photographs will serve as the pre-treatment record of the stone condition.

Preservation Fundamentals

Preservation is not an especially difficult concept to grasp, although admittedly some work diligently to make it seem so. The fundamental concepts are well presented in the Secretary of the Interior's Standards for Preservation (see Table 1).

This document reminds us – at least at a general level – of what we need to be thinking about as we begin repairs at a cemetery. Those responsible for the care of Oak Grove should be intimately familiar with the eight critical issues it outlines.

For example, all other factors being equal, a cemetery should be used as a cemetery – not to walk dogs, not as a play ground, and not as a park. And until we are able to do what needs to be done, it is our responsibility to make certain that the site is preserved – it must not be allowed to suffer damage under our watch. This is an especially important point and it relates to the urgency of the work discussed in this study.

We must work diligently to understand – and retain – the historic character of the cemetery. In other words, we must look at the cemetery with a new vision and ask ourselves, "what gives this cemetery its unique, historical character?" Perhaps it is the landscape, the old and stately trees, the large boxwoods, the magnificent arborvitae. Perhaps it is the very large proportion of complex monuments, or the exceptional obelisks. Whatever it is, we become the guardians responsible for making certain those elements are protected and enhanced (whether they are particularly appealing to us or not).

Whatever conservation efforts are necessary must be done to the highest professional standards; these conservation efforts must be physically and visually compatible with the original materials; these conservation efforts must not seek to mislead the public into thinking that repairs are original work; and the conservation efforts must be documented for future generations. If an agency doesn't have a conservator or if the caregivers aren't conservators, it is our responsibility as the stewards of the property to retain a conservator appropriately trained and subscribing the Code of Ethics and Standards of Practice of the American Institute for Conservation (AIC).

Table 1.
Secretary of the Interior's Standards for Preservation

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

The Secretary of the Interior reminds us that each and every cemetery has evolved and represents different styles and forms. It is our responsibility to care for all of these modifications and not seek to create a "Disney-land" version of the cemetery, tearing out features that don't fit into our concept of what the cemetery "ought" to look like.

Likewise, we are reminded that there will be designs, monuments, and other features that characterize our cemetery – and we are responsible for identifying these items and ensuring their preservation. We must be circumspect in any modifications, ensuring that we are not destroying what we seek to protect.

Before acting, we are required as good and careful stewards to explore and evaluate the property, determining exactly what level of intervention – what level of conservation – what level of tree pruning -- is actually necessary. And where it is necessary to introduce new materials – perhaps a pathway – into the cemetery, we must do our best to make certain these new elements are not only absolutely necessary, but also match the old elements in composition, design, color, and texture. In other words, if the cemetery has brick pathways, we would be failing as good stewards if we allowed concrete pathways – especially if our only justification was because they were less expensive.

Where conservation treatments are necessary, the Secretary of the Interior tells us that they must be the gentlest possible. However you phrase it – less is more – think smart, not strong – we have an obligation to make certain that no harm comes to the resource while under our care. And again, one of the easiest ways to comply is to make certain that caregivers retain a conservator subscribing to the ethics and standards of the American Institute for Conservation.

Finally, we must also recognize that the cemetery is not just a collection of monuments and the associated landscape – the cemetery is also an archaeological resource. We must be constantly thinking about how our efforts –

whether to repair a monument or remove vegetation downed by a tornado – will affect the archaeological resources – archaeological resources that just happen to be the remains of people buried at the cemetery by their loved ones.

These are especially critical issues in the case of Oak Grove Cemetery since there is often a rush to repair devastating damage. In spite of the damage and the emotional desire to "set things right" as quickly as possible, it is essential that the Secretary of the Interior's Standards be carefully followed.

Our first recommendation, therefore, is that the caregivers become thoroughly familiar with the Secretary of the Interior's Standards for Preservation and reaffirm their responsibility as stewards of this historical resource to ensure that future preservation efforts are consistent with sound preservation principals and practices.

Acceptable Conservation/Preservation Procedures

We will briefly outline a few critical issues for different conservation or preservation approaches at Oak Grove. In some cases volunteers may be able, with training, to carry out simple activities. In many cases, most particularly conservation of stone, volunteers are strongly advised not to undertake the work. In fact, even professionals in related fields may be inappropriate. Just as one would not ask a house painter to repair an oil painting, it is important that handymen or stone/brick masons familiar primarily with modern materials and techniques not undertake the conservation treatments outlined in this assessment.

The work should be completed by conservators thoroughly familiar with the exacting requirements of the treatment involved. Given the importance of the Oak Grove monuments, we recommend that only stone conservators who subscribe to the Standard of Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC) be retained to conduct any treatments in the Cemetery. This is also a requirement for reimbursement by FEMA.

Stone Conservation

Ideally treatment can begin quickly, thus minimizing additional damage, helping to restore normalcy, and preventing loss or theft of the fragments.

If this is not possible, then f***ragment storage*** must be designed to protect fallen or broken stones from loss and damage. Stone fragments will need to be collected, identified using stainless steel or aluminum tags attached using nylon string loosely tied to the fragments, and stored under cover and off the ground. All locations must also be marked on a map, providing another means of identifying the original location.

Stones must be prevented from touching (and abrading) one another through the use of wood sheets, foamcore, and/or plank ethafoam. The storage facility must be secured, preventing unauthorized individuals from handling – and potentially further damaging – the stones.

Resetting is necessary for some stones. The simplest resetting involves stones which are tilted or which have come out of the ground. These should never be reset using concrete, but rather should be set in pea gravel. This approach allows the stone some movement should it be accidentally impacted by lawn maintenance activities. The pea gravel will also promote drainage away from the stone, helping the stone resist the uptake of soluble salts.

In cases where stones are loose in a supporting base, resetting involves the use of a wet, high lime mortar mix. In this and all other areas of treatment, the Cemetery should avoid the use of Portland cement. It is entirely too hard for the stones and may contain impurities

that will damage the stone through long-term exposure. More appropriate is a 1:3 mix of air lime (such as lime putty) or NHL 2 and sand. Epoxy and other adhesives should never be used since once set it is virtually impossible to remove the material. Even the use of commercial setting compounds used by the monument industry should be limited to use on granite markers produced within the last 50 years.

At times resetting may be made more complex by the presence of corroded iron dowels. Where present these must be removed before the stones can be reset. Such a repair requires that the old pins be drilled out using a core drill, new pins of stainless steel be inserted using an appropriate epoxy, and mortar then used to set the monument. This is a treatment which should be performed only by a trained conservator.

Cleaning stones *simply for the sake of appearances is usually ill-advised.* Such efforts endanger the stone and often promote even quicker soiling afterwards. Where cleaning is critical, it should be limited to the use of low pressure (i.e., less than 90 psi) water and soft bristle brushes or, where necessary, the use of D/2 Architectural Antimicrobial.

Commercial stone cleaning methods are inappropriate for use in historic burial grounds such as Oak Grove. *In absolutely no case should sandblasting, stone refinishing or polishing, or high pressure water washing, bleaches, or acid cleaning be used at Oak Grove Cemetery. Commercial cleaning agents should only be used under the direction of a stone conservator.*

Coatings are not recommended for any stone material at Oak Grove. Many coatings are actually detrimental to the stone, causing staining, efflorescence or scaling. Moreover, coatings are not reversible, so once applied they are impossible to remove should detrimental effects be noted. There are a very few that appear to be vapor permeable and are being tested for possible use on stone. Even these, however, should be used only under the direction of a stone conservator and sparingly.

Mechanical repair most often means the rejoining of fragmented stones. *Such work should be undertaken only by stone conservators trained in this area.* In most cases gravestones are fragile and their repair is delicate work. There are many commercial products on the market, used by many commercial stone companies, which are totally inappropriate for historic stone.

Appropriate conservation treatment will usually involve drilling and pinning, carefully aligning the two fragments. Threaded 316 stainless steel rod (or occasionally nylon) and epoxy adhesives formulated for the specific stone are used in this type of repair. Diameters and lengths of pins vary with the individual application, depending on the nature of the break, the thickness of the stone, its condition, and its expected post-repair treatment.

Sometimes pins are not used to save time and money. Instead the pieces are simply joined using a continuous bead of epoxy or some other adhesive. Experience indicates that for a long-lasting repair, particularly in non-structural applications, use of pins is usually necessary. Moreover, most adhesives are far stronger than the stone itself, meaning that failure of the repair is likely to cause additional damage to the stone.

At times mechanical repairs also involve dismantling intact elements and ensuring that a sound foundation is present. Foundation work may involve filling in depressions, establishing a concrete footing, or taking other measures to ensure that subsidence is minimized. Then the entire structure is repaired as it is reassembled.

In some cases concrete has been used to repair broken stones. This is inappropriate. Not only is the result aesthetically unappealing, but the concrete is far harder than the stone and can cause long-term deterioration. Because the concrete is very difficult to remove, we generally

recommend that stones repaired with concrete be left as they are, as long as the old repair is stable and causing no immediate damage or problems. Such repairs, however, should be carefully monitored. It is likely that the time will come when these old repairs will fail and a more appropriate repair will become possible.

Composite stone repair consists of filling voids with a natural cementitious composite stone material resembling the original as closely as possible in texture, color, porosity, and strength. This type of repair may be used to fill gaps or losses in marble and is often used to help slow scaling of bedded sandstone exposed to the elements.

Under no circumstances should latex or acrylic modified materials be used in composite stone repair. These additives may help the workability of the product, but they have the potential to cause long-term problems. Such products are not appropriately matched in terms of strength or vapor permeability.

More suitable materials are materials such as Jahn (distributed by Cathedral Stone) or the lime-based mortars of U.S. Heritage. These closely resemble the natural strength of the original stone, contain no synthetic polymers, exhibit good adhesion, and can be color matched if necessary.

All infill work should be conducted by a trained conservator. The Jahn products, in fact, require certification in their use through Cathedral Stone.

Brick Conservation

The primary use of brick at Oak Grove is in the construction of plot walls or vaults. There are, in addition, some ledgers of brick with a Portland cement capping (which is often failing).

We also noted that often repairs exhibited poor workmanship, detracting from the historic character of the cemetery and failing to respect the original materials.

Repairs should always begin with photographing the structure as it exists in order to completely document the original fabric and construction details. Only the unsound brickwork should be removed, stopping as soon as sound material is encountered. Repair should, as far as possible, use similar brick, mortar, joints, and tooling. Brick should match in size, hardness, texture, and color. Mortar should match the original in color, texture, and most importantly, strength.[1] Historic bricks are often far softer than modern examples. The use of a modern hard cement mortar will cause extensive damage to this soft brick as one expands more rapidly than the other. Mortar should always be designed to deteriorate more quickly (meaning the use of high lime mortars) than the brick since it can be readily replaced through pointing.

The single best guide for repointing (short of specifications developed by a conservator for a specific job) is *Preservation Briefs 2: Repointing Mortar Joints in Historic Masonry Buildings*.

Concrete Repair

Concrete has been extensively used in the twentieth century Oak Grove plots, both as ledgers covering the burial, and also as coping. Much of this concrete has been significantly damaged by uplifted trees or falling objects.

[1] While historically appropriate mortars can be mixed, typically as a 1:3 ratio of either lime putty or NHL 2 or 3.5 with sand, recently prepackaged mixes have been marketed. These products are superior when only large jobs are undertaken, since they assure that the materials and mix are consistent. They are available from Virginia Lime Works (Mix-n-Go) and Cathedral Stone (Restomix).

There are basic procedures to be followed in concrete use, yet shortcuts are often taken that ultimately result in significantly compromised concrete. The durability of any concrete depends on the quality of the mix and workmanship involved in mixing, placing, compacting, and curing. For example, low permeability of finished concrete depends on the hydration of the cement to fill interstice voids that are initially filled with water. Keeping the newly cast concrete moist prevents the fresh concrete from drying too quickly and allows hydration to continue; this, in turn, promotes greater durability.

Concrete additives must be minimized in conservation work. Some additives, such as those allowing work in very cold or very hot conditions actually serve to weaken the concrete and promote its premature deterioration.

Concrete repairs (like other masonry work) should match the finish, profile, and color of adjacent concrete. The procedure involves removing the damaged sections to a 2-inch minimum depth and 2-inches beyond the damaged area in all directions. New surfaces must be roughened. Often it is necessary to install threaded fiberglass dowels to tie concrete together. If there is reinforcement, it must be cleaned to bright metal and primed with zinc rich primer or it must be removed and replaced with fiberglass rod. Regardless, all reinforcement should be kept at least 1½-inches from edges. It is typically necessary to coat the existing concrete with bonding agent.

Ironwork Conservation

Every effort should be made to retain all existing ironwork, regardless of condition. Replacement with new materials is not only aesthetically inappropriate, but often causes galvanic reactions between dissimilar metals. When some of the existing ironwork is incomplete, a reasonable preservation solution is to repair and maintain the remaining work rather than add historically inappropriate and incorrect substitutes. If replacement is desired, salvage of matching elements is preferred over recasting. Replication is typically not an appropriate choice since it is by far the most expensive course of action, and is often done so poorly.

The single best protection of ironwork is maintenance — and this revolves around painting. The correct procedure focuses on minimal cleaning, followed by two coats of a rust converter, and a final top coat of a flat or semi-gloss alkyd paint.

Repair may include reattachment of elements. Ideally repairs should be made in a manner consistent with original construction. For example, most newel posts were originally attached to a stone or masonry base using a threaded rod packed in lead. When this assembly is loose, the ideal approach is to replace the threaded rod, repacking it using an epoxy filler (lead is rarely recommended both because of its health consequences and also because lead-iron contact promotes corrosion).

It may also be appropriate to use small stainless steel braces with stainless steel nuts and bolts to re-attach coping rails to posts. While welding is often expedient, this approach causes a radical change to the fence and should be avoided. Once welded, pieces are no longer able to move with expansion/contraction cycles, and this causes internal stresses that may lead to yet additional structural problems. Careful inspection of fences in good condition reveals that virtually all connections were “slip joints” – allowing the parts to expand and contract. Unfortunately there has been much welding at Oak Grove and this will create many long-term problems.

In addition, while wrought iron is easy to weld because of its low carbon content, cast iron contains up to 4% carbon and is difficult to weld. Welding on cast iron should be done only by firms specializing in this work and capable of preheating the elements. An alternative is to

braze cast iron since this approach requires much less heat.

When used, welds should be continuous and ground smooth, in order to eliminate any gaps or crevices. When finished, it should be difficult to distinguish the weld — the original metal should blend or flow directly into the reattached part.

When the fence is buried in the soil all that need be done is to resculpt the ground, lowering it below the bottom rail. This will not only resolve the corrosion problem, but can also promote better drainage away from the ironwork.

Ironwork also benefits from careful caulking of joints to prevent capillary uptake of moisture – which promotes corrosion in joints and other small crevices. An appropriate caulk is a premium-grade, high-performance, moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant.

Understanding Priorities

It is critical that organizations establish priorities for cemetery conservation projects, ensuring that the most critical issues are dealt with first. Sound priorities will be based on two factors:

> First, is the object a threat to people? Examples of this include loose monuments which might topple.
>
> Second, is the object a threat to itself? In other words, if left unattended, will the condition deteriorate and cause additional damage, and expense to repair? Examples of this include monuments which might topple and break.

It should be abundantly clear that first priority items require immediate — even emergency — treatment in order to ensure the safety of visitors and avoid claims of liability against the City of Americus.

Second priority items are nearly as important since failure to deal with these items will result in repairs costing far more as the condition deteriorates. *Deferred maintenance is not only poor stewardship, but it is fiscally irresponsible. Simple repairs, delayed, turn into very expensive treatments.*

Beyond these two priorities, all other issues in the cemetery fall into a third category. Examples might include infill, replacing missing features or elements, repairing most coping, and cleaning of stones. It is far more critical that the caregivers establish, as their third priority, a preventative maintenance program that will help to ensure that appropriate maintenance is carried out on an on-going basis, limiting the need for future emergency treatments. Only once all priority one (threatening to human life) and priority two (threatening to the safety of the monument or other features) and a preventative maintenance program is established, should the caregivers of Oak Grove turn their attention to more cosmetic repair issues.

TREATMENT OF VEGETATION ISSUES

Introduction

In this section we will consider issues associated with the removal of downed or heavily damaged vegetation. These issues include:

- the potential requirement for archaeological investigation,
- health related issues associated with human remains, and
- removal tactics to avoid additional damage to the landscape and monuments.

There are, of course, additional issues, such as compliance with OSHA, that are routinely involved – these are not being included in the discussions.

Archaeological Issues

Many of the trees affected by the tornado were not snapped, but their root balls were partially removed from the ground. In some cases the depth of disturbance appears to be at least 2-3 feet. It is also clear that in some cases the trees were in very close proximity to graves – or at least to the monuments thought to mark graves. Consequently, there is the possibility that human and archaeological remains may be exposed.

Prior to any further ground disturbing work, we recommend that these root balls receive an archaeological investigation consisting of both a visible examination and also inspection using a metal detector. Investigations should seek to identify any human remains, coffin hardware, or burial goods that might be exposed.

It will also be necessary to investigate the loose soil below the root balls since materials may have dropped out of the roots.

Because of the acidic soils and disturbance by root action, human remains exposed will likely be in very fragile condition. To recover these remains we recommend first outlining the specific sections of the root balls that contain evidence of burials, as indicated by metal detector scans and visual inspection. Archaeologists can then use trowels or other tools to recover remains from the root ball by loosening the soil and screening it through ¼-inch mesh.

Other items which might be encountered include coffin hardware, such as handles or decorative escutchions. These are commonly encountered in such work. It is also possible that grave goods, such items of shroud pins, clothing remains, or jewelry may be encountered.

All recovered items should be photographically documented in the field. Human remains should be measured and recorded as necessary by a forensic anthropologist.

The recovered remains should be placed into an appropriate container (temporary containers such as plastic bags are typically replaced by small plywood boxes once sizes are known) for reburial in the exposed grave site (or as close to it as possible). Each of the boxes should have a small stainless steel marker with the date of the tornado and of the reburial, with a brief explanation of the disturbance and restoration.

Figure 5. Example of vault damage requiring archaeological investigation. The open vault should also be secured prior to conservation treatment to prevent looting, desecration, or vandalism.

During storage prior to reburial these remains should be kept secured, following normal "chain of custody" procedures. This will ensure that all items recovered are eventually reburied.

We anticipate that the larger root balls will each require about a day of archaeological attention by two individuals. Because of the fragility of the remains, their potential for rapid loss through weathering (or removal by the curious), and the need to conduct these studies prior to the removal of the root balls from the cemetery, this work should commence immediately. Cemeteries will become the targets of treasure hunters, curiosity seekers, and vandals.

Health Related Issues

There can be health concerns when dealing with human remains. Most of these concerns, however, focus on soft tissues. Organisms responsible for plague, cholera, typhoid, and tuberculosis are unlikely to survive long in a buried cadaver. However, the risks posed by anthrax and smallpox are less easily refined.

Anthrax spores can remain viable for at least 80 years in a context where no special precautions have been taken. Skeletonized remains are less likely to pose a threat. In general it is recommended that only those who are tolerant of penicillin, or its alternatives, are involved in crypt excavation.

Smallpox risk exists where previously infected inhumations have surviving skin with scabs (the site where the virus might survive). The chance of this occurring is minimal; however, any non-skeletonized remains must be considered a possible risk.

Figure 6. Tree root uplift that has potentially disturbed the grave and requires archaeological investigation prior to removal.

Chemical dangers seem to far outweigh biological risks. Often mentioned chemicals in a cemetery context include arsenic, mercury, lead oxides, and formaldehyde.

Arsenic was in common use as an embalming agent between 1850 and 1910. Patents for embalming fluids in the middle quarter of the nineteenth century contained between 4 ounces and 12 pounds of arsenic per body. Because arsenic does not breakdown over time, it can be expected to move into the surrounding soil or leach into the ground water below cemeteries.

Mercury, another heavy metal, was used similarly to arsenic and may be found in the soils. Formaldehyde, in use today, tends to be volatile and will rarely be found in soils. Lead oxide may be present as a result of lead in coffins or their seals.

At a minimum it is essential that good hygiene be practiced. Care should be taken to avoid excess contact with the soil. Hands should be washed thoroughly before smoking or eating. Nitrile gloves should be worn when troweling or screening soil from grave contexts. Drinking water should be kept far enough from the work area to prevent contamination. Fresh clothing should be worn daily. Boots should be wiped down at the end of the work shift to remove adhering soil and dust. Dust control is essential and may involve regularly spraying the soil. Only enough water should be used to keep the surface from dusting – excess water will create runoff and additional contamination problems. If dust becomes an issue an N90 particulate respirator may be used.

Vegetation Removal Procedures

Tree removal is inherently dangerous and should be performed only by tree removal contractors familiar with the shifting dynamics of fallen, toppled, or hanging trees. These procedures are in no way meant to supplant or interfere with standard safety practices for this type of work.

If the trunk of the fallen tree is supported by its branches and there are gravestones beneath or near the trunk or root ball, it is essential that timber cribbing to used to support the trunk before removing any branches. Cribbing must not be braced against or be placed on top of monuments, curbing, obvious grave shafts, or other cemetery features.

If broken monuments are beneath the fallen tree's branches, document their location and remove them prior to the tree removal.

Tree branches and the tree trunk should be cut into short lengths, working from the branches to the trunk. Care should be taken to prevent any additional damage to monuments (for example by sawing through a trunk and into the underlying marble monument. Trucks, trailers, and other heavy equipment must be kept on established paved roads and off road shoulders, paths, or lawns.

Once the root balls have been investigated for archaeological remains, any remaining soil may be removed and deposited in the underlying (or adjacent) hole. The root ball should be saw-cut into sections small enough to remove by hand, wheelbarrow, or hand truck. Truck-mounted grapples may be used only if they can be parked on a road and extended to the root ball.

For those stumps which are not partially or wholly removed from the soil, stump grinders may be used *only if the equipment can be placed without endangering monuments and all surrounding monuments may be protected by plywood from flying chips*. Grinding should extend no more than 2-3 inches below grade. It is also acceptable to flush-cut stumps to grade and allow them to naturally decompose.

Once all stumps have been removed, the remaining depressions should be filled with

Figure 7. This is an example of a stump that should not be removed or ground, but left in place to allow natural decay. The protruding tree sections should be carefully removed.

clean white sand (or some soil that is distinguishable from the cemetery soil) and compacted.

All debris must be raked (from lawn areas) and swept (from monuments or curbing). The raked/swept debris must be inspected for any stone fragments prior to disposal.

Lawn areas in and around the removed root balls should be resodded using an appropriate turfgrass. Standard specifications should be used to guide the process. In general these specifications will require that the turfgrass be strongly rooted and free of pernicious weeds and bent grasses. It shall be mowed to a height not to exceed 2-inches before cutting and lifting and shall be of uniform thickness; not over one and 1½) or less than 1-inch of soil. Sod shall be delivered within 24 hours after being cut and shall be installed within 36 hours after cutting.

The subgrade material shall be loosened and mixed to a depth of 2 to 4-inches. All sticks, stone over 2 inches and rubbish shall be removed and the whole area compacted so that it will be parallel to the finished grade. A commercial fertilizer formula 10-6-4 shall be applied to the upper 2 inches of soil at the rate of 10 pounds per 1000 square feet and thoroughly raked in.

The sod bed will be lightly sprinkled just prior to laying the sod. Do not create muddy soil. All sod strips will be placed tightly against each other so no open joints are apparent. Joints between ends of strips will be staggered at least 1-foot between adjacent rows. At the end of walks and drives, the sod will have the same finish grade as the abutting surfaces. At curbs the sod will have the same finish grade as the top of the curb.

It will be necessary to ensure that the sod is kept moist to allow rooting, especially if it is laid during the summer. If the cemetery does not have a sprinkler system (which is not recommended), hose and portable sprinklers will be necessary.

Reseeding is far less satisfactory and should be avoided.

LANDSCAPE RESTORATION

Introduction

There is no question that the Oak Grove landscape has been significantly impacted by the March 1 tornado. The restoration of that landscape is more difficult to address, primarily because the cemetery lacks a comprehensive cultural landscape report and its associated documentation.

While we know what was damaged or lost as a result of the tornado, much of these materials were the result of unplanned actions that lack historic documentation. Their repair, reconstruction, or restoration is of considerably less importance than the effort to repair damage to what are obviously historic features.

The guiding principles for landscape restoration are outlined by the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.* The Standards for Reconstruction are very simple:

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture, and such reconstruction is essential to the public understanding of the property.
2. Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archaeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.
3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.
4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving property in materials, design, color, and texture.
5. A reconstruction will be clearly identified as a contemporary re-creation.
6. Designs that were never executed historically will not be constructed.

These standards require us to consider several factors. First, as previously mentioned, there is no cultural landscape report for Oak Grove. Thus, we have no documentary study of what was present nor are we aware of any historic plan (implemented or not) for the cemetery. In fact, we suspect that there was no historic plan – a situation characteristic of many (although not all) city cemeteries. The speed required of this study has precluded any historic research and we are not aware of any historic photographs of the cemetery that might guide reconstruction efforts.

Second, much of the lost vegetation was modern and had been placed without benefit of a landscape plan. It is unlikely that archaeological investigations had been conducted prior to plantings

Third, not all of the lost vegetation would normally be considered appropriate in terms of cemetery management.

As a result, this study will attempt to negotiate a difficult path that maintains a continuity with the historic roots of Oak Grove, while recognizing that we have limited data.

Lost Trees

We are told that lost trees include 42 pines, 21 oaks, 28 cedars, six magnolias, two cherry laurels, one juniper, three Bradford pears, and one linden. We do not, however, have information on the size of the lost trees.

Pines

Pines are not an especially appropriate tree for cemetery use. They drop sap on monuments; produce much litter; are inherently weak and prone to wind and ice damage; and require large amounts of water, limiting the growth of understory vegetation or turfgrass.

Figure 8. Pines such as this are not a good choice for cemetery planting. We recommend that they be removed and that lost pines not be replanted.

We noticed an inordinate number of young plants throughout the cemetery. We recommend their removal. We also do not recommend the replanting of any pines lost as a result of the tornado.

Oaks

The cemetery name, Oak Grove, suggests that oaks have been an important historic component of the cemetery. We recommend the use of live oak for replacement specimens. The live oak is the state tree of Georgia and is strongly reminiscent of the old South.

While only medium in growth rate, live oak is a very long-lived tree if appropriately located and planted. It is evergreen or semi-evergreen, break resistant, and drought tolerant. It is tolerant of a wide range of soil conditions. Overall, live oaks have outstanding ornamental qualities.

Live oak, however, must be carefully located. A spread of 60 to 120 feet can be anticipated, requiring that it be given plenty of room (>200 square feet). Its roots will also lift sidewalks and other hardscape (including tombs), so it must be located in relatively open areas. It also requires pruning for strong structure. Moreover, pruning is required for vehicular or pedestrian clearance.

Other suitable oaks – that are overall smaller – include the southern red oak (with a spread of 60-70 feet) and the willow oak (with a spread of 40-50 feet). The willow oak is also a faster growing tree that may help fill in voids.

Cedar

The eastern red cedar is a traditional cemetery tree, although its fruit is devoured by

birds and it is frequently an "accidental" planting. Nevertheless, it is a good choice for historic cemetery property. With a height of 40 to 50 feet and a spread of 10 to 20 feet it can easily fit in many cemetery contexts. There is no significant litter problem, although pruning is required for vehicular or pedestrian clearance.

The cemetery, however, should be aware that cedar is susceptible to breakage either at the crotch due to poor collar formation (which can be eliminated through careful selection prior to planting) or the wood itself is weak and tends to break (as exhibited by the losses as a result of the recent tornado). Nevertheless, it is drought tolerant, tolerates a wide range of soil conditions, and is a good cemetery choice.

Magnolia

Like the live oak, the southern magnolia is a traditional plant for the region. It is also frequently found in cemeteries.

We recommend, however, that it be replanted only as a specimen tree since it has major drawbacks. One of the most significant is the very dense litter it produces. This problem can be minimized by careful planting location. If the tree is not pruned to raise or lift the canopy and the branches are allowed to droop naturally, then the tree self-mulches. Another significant problem are the surface roots. This problem is also resolved through careful planting location. If it is used as a specimen tree away from monuments and not pruned, then the surface roots are not troublesome.

Expect a spread of 30 to 40 feet and plant away from vaults, monuments, and roadways. Again, we recommend replanting only one or two of these lost trees and ensuring that the location is suitable.

Cherry Laurel

This is not an especially appropriate tree for cemetery plantings. It produces large amounts of litter and it is invasive, readily seeding itself into the landscape. Moreover, the plant, if used for screening, requires considerable pruning, which is rarely provided.

We do not recommend its replanting.

Bradford Pear

The Bradford pear is a showy tree during flowering and is very fast growing, quickly filling in vacant spaces. These positive features, however, must be balanced against the tree's very weak natural structure that makes it easily susceptible to damage and its tendency to exhibit surface roots. It is also a very short-lived tree and its planting should not be expected to last more than 10-15 years.

If there are very specific locations where a fast growing tree is needed, with anticipation that a more slow growing tree will eventually fill in the space, then the Bradford pear may be acceptable. Otherwise, we do not recommend its use.

Linden

The American linden can be an excellent specimen tree, when planted singly with adequate space on all sides for its development. It is, unfortunately, too often overused and crowded, thereby negating all of its positive features.

The tree achieves a height of 70 to 80 feet with a spread of up to 50 feet. As a specimen, it has an upright, oval canopy atop a tall, straight trunk. The lower branches remain on the tree and gently drape toward the ground before sweeping up in a gentle curve.

Assuming there is adequate space, this tree could be replanted.

Assessing Damage and Appropriate Pruning

The cemetery has thus far focused on cleaning up and removing trees after the tornado. However, even after a severe weather event, many trees can be restored. If major limbs, trunk, and roots are intact, restoration is a good option. Typical problems that can be corrected through restoration include defoliation of the canopy, loss of some (but not all) major limbs, broken small branches, loss of canopy in decay resistant species, and small trees that are leaning.

While landscape professionals can typically handle the removal of trees in open areas or the removal of dead or hazardous limbs, a certified arborist is needed for much of the work encountered in a cemetery. In particular, a certified arborist should remove leaning trees, removing any limbs that require climbing, restoring trees, and pruning to promote good structure. These are jobs that must be undertaken only by certified arborists.

A certified arborist is one certified by the International Society of Arboriculture (ISA). Being certified requires professional experience and knowledge of the best techniques in the industry. Arborists attend training classes and continuing education classes to learn the latest research. Their work also conforms to ANSI Z133.1 and A300 guidelines – representing safety standards for tree care operations and best management practices for pruning and other tree care operations.

Local trades people, much less prisoners, are not capable of meeting the high standards of professionalism required in arboriculture practice for cemetery settings.

Table 1 lists certified arborists in southwest Georgia.

Table 1.
Certified Arborists in the vicinity of Americus

Edwards, W. David	D & D Tree Service, Inc. ALBANY, GA 31701	229-435-6722	davidedwards@mchsi.com
Wagner, Jim		229-889-5107	
Daniel, William	Best Landscaping Company COLUMBUS, GA 31909	706-329-9651	bestland@mindspring.com
Dunn, Christopher	Stay Green COLUMBUS, GA 31904	706-569-9140	cjd3@knology.net
Edwards, Baxter	Treeman Tree Service, Inc. COLUMBUS, GA 31907	706-681-0914	bedwards@mortonmachineworks.com
Elmore, Kevin	Callaway COLUMBUS, GA 31904	706-663-6758	kevinelmore@hotmail.com
Genet, Margaret	Best Nursery & Gifts COLUMBUS, GA 31904	706-576-6524	ham_genet@peoplepc.com
Turner, Michael	Weber Construction COLUMBUS, GA 31904	706-596-0048	

Tree Replanting Plan

Historic Specimens

Where historic specimens have been lost (and assuming they are not pines, as discussed above), we recommend the replanting of the lost trees. If the root ball of the lost tree is eventually removed, then replacing should be in the same spot – assuming that replanting in that location is appropriate given the spread of the tree.

In other words, do not repeat past mistakes. If a cedar, with a known spread of 20 feet, was originally planted only 5 feet from a

Figure 9. Example of a tree that requires an assessment by a certified arborist to determine if restoration pruning is possible.

monument, then it must not be replanted at that location. To do so would only recreate the maintenance problem. The solution is to relocate the tree to a spot where a spread of 20 feet is feasible, allowing the tree plenty of room for expansion.

If the root ball is not removed, then the replacement tree must naturally be relocated. The relocation should be the minimum amount necessary to ensure that the roots have room to expand and the tree will not interfere with nearby monuments.

Non-Historic Specimens

We do not recommend the replanting of non-historic specimens.

Instead, an heirloom tree can be selected and, assuming there is adequate space, be planted. Or the space can remain open until such time as the cemetery completes a cultural landscape report.

Tree Planting Requirements

We often see inappropriate nursery stock being planted in cemetery contexts – trees that are undersized, that include damaged root balls, that evidence encircling roots, or have the root flair below the soil surface. Nursery stock must be inspected carefully to pick the best quality tree. Trees with poor quality may be inexpensive, but they will almost always perform poorly in the landscape.

All restoration plants should, at a minimum, meet these specifications:

1. There shall be no roots greater than 1/10 diameter of the trunk circling more than one-third the way around in the top half of the root ball. Roots larger than this may be cut provided they are smaller than one-third the trunk diameter. There shall be no kinked roots greater than 1/5 the trunk diameter. Roots larger than this can be cut provided they are less than one-third the trunk diameter.
2. Trees should be rooted into the root ball so that soil or media remains intact and trunk and root ball move as one when lifted, but not root bound. The trunk should bend when gently pushed and should not be loose so that it pivots at or below soil line.
3. The point where the top-most root in the root ball emerges from the trunk shall be within two inches of the soil surface. It can be exposed and visible at the soil surface.
4. The relationship between caliper, height and root ball size shall meet the ANSI Z60.1 standard.
5. There should be one dominant leader to the top of the tree with the largest branches spaced at least 6 inches apart

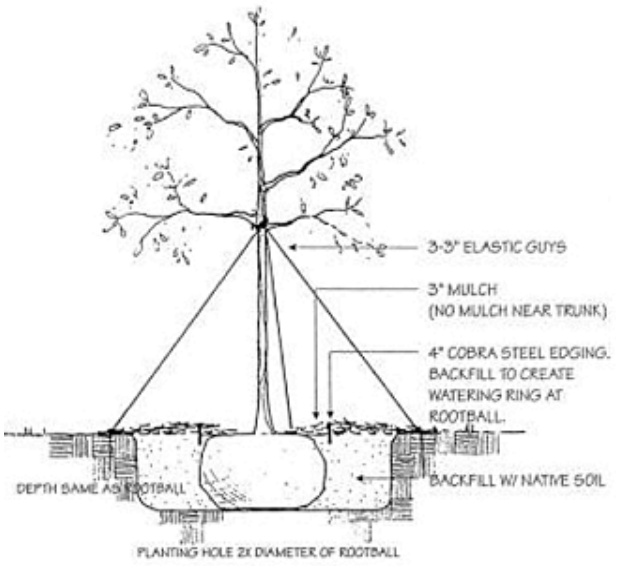

Figure 10. Appropriate planting of good nursery stock will help ensure successful and healthy growth.

(see illustration top-left). There can be a double leader in the top 50% of the tree on a quality plant or in the top 10% of the tree on a plant of exceptional quality.

6. The tree canopy should be mostly symmetrical and free of large voids. Clear trunk should be no more than 40% of tree height unless otherwise specified in the planting specifications.
7. Branches should be less than 2/3 the trunk diameter.
8. Trees greater than 1.5 inches caliper should be able to stand erect without a supporting stake.
9. Open trunk and branch wounds shall be less 10% of the circumference at the wound and no more than 2 inches tall. Properly made pruning cuts are not considered open trunk wounds. There should be no conks or bleeding, and there should be no signs of insects or disease on more than 5% of the tree.
10. If any of the above conditions are not met, trees will be rejected.

We also see incorrect planting techniques, such as planting too deeply, inadequate irrigation, and over mulching. These are critical steps in appropriate planting:

1. Dig a shallow planting hole as wide as possible. A hole three times the width of the root ball is recommended; never excavate a hole smaller than one-and-one-half the diameter. In many instances, the depth of the hole should be *less* than the height of the root ball, especially in compacted or wet soil. If the hole was inadvertently dug too deep, add soil and compact it with your foot. Breaking up compacted soil in a large area (out to the dripline of the tree) around the tree provides the newly emerging roots room to expand into loose soil. This will hasten root growth translating into quicker establishment. Loosen the soil with a rototill, shovel, or another tool.
2. Find the point where the top-most root emerges from the trunk. If this is buried in the root ball then remove enough soil from the top so the point where the top-most root emerges from the trunk is within the top two inches. A swelling (called trunk flare, root flare, root crown) may or may not be present where the top-most roots join the trunk. Check for and treat circling roots especially in the top half of the root ball. Soil above the top-most root may have to be removed to check for these. The point where the top-most roots emerge from the trunk can be exposed and visible.
3. Slide the tree carefully into the planting hole. To avoid damage when setting the tree in the hole, lift the tree with straps or rope around the root ball, *not by the trunk*. Special strapping mechanisms need to be constructed to carefully lift trees out of large containers.

4. Position the point where the top-most root emerges from the trunk even with or slightly above the surface of the landscape soil. It is better to plant the tree a little high than to plant it too deep. If the tree is too deep in the hole, remove it from the hole and firmly pack soil in the bottom of the hole to raise the root ball. Once it is at the appropriate depth, place a small amount of soil around the root ball to stabilize it. Soil amendments are usually of no benefit. The soil removed from the hole makes the best backfill unless the soil is terrible or contaminated. Cut roots that are kinked or any that circle the top of the root ball where appropriate. If these cut roots are large, the tree might shock and could die.
5. Straighten the tree in the hole. Before you begin backfilling have someone view the tree from two directions perpendicular to each other to confirm the tree is straight. Fill in with some more backfill soil to secure the tree in the upright position.
6. Remove all synthetic materials from around the trunk and root ball. String, rope, synthetic burlap, strapping, plastic, and other materials that will not decompose in the soil must be removed at planting.
7. Slice a shovel down into the backfill 20 to 30 times all around the tree as you add backfill soil. Attempt to break up clayey soil clumps as much as possible. Do *not* step firmly on the backfill soil because this could compact it and restrict root growth. When the planting hole is filled with soil the root ball should remain 1 (small trees) to 3 (larger trees) inches above the backfill soil. Add 10 to 20 gallons of water to the root ball and backfill. Fill in any holes or depressions with additional backfill soil. Do not firmly pack backfill soil in an attempt to eliminate air pockets because this could cause too much soil compaction. The water infiltrating the backfill soil will eliminate the large air pockets.
8. Cover the sides of the root ball with mulch and apply mulch to at least an 8 foot diameter circle around the tree. Construct a berm out of mulch at the edge of the root ball only if the tree will be watered with a hose, bucket, or other high volume means. Constructing a berm in all other situations will not provide more water to the root system. Do not construct a berm from soil since this soil could end up over the root ball several months later. Water the mulch well after it is spread.
9. Stake the tree, if necessary to hold the root ball firm in the soil. If the root ball moves in the wind, emerging roots could break and trees will establish slowly. Staking to hold a weak trunk upright should not be necessary on trees with a trunk diameter more than about 1.5 inches. If large trees require staking to prevent the trunk from bending, it probably indicates a lesser quality tree. Smaller trees might require staking until enough trunk strength develops. Trees could establish more quickly and develop a slightly stronger trunk and root system if they are not staked at the time of planting.

Pruning

Pruning trees is a very complex issue and we can't begin to do it justice here. For example, one critical issue in pruning young trees is ensuring that they develop one dominant trunk – achieved by shortening competing braches with reduction cuts. When performed regularly, this makes trees stronger by allowing the main trunk to grow larger than the branches.

Unfortunately, too few cemeteries take the time to ensure that their landscaping staff is appropriately trained. This is almost certainly the case at Oak Grove where we understand that much of the work is done by prison labor where there is no continuity or professional training. We recommend that all pruning be conducted by arborists with specialized training – even if this requires the City of Americus to hire a landscape company to semi-yearly visit the cemetery and conduct appropriate pruning.

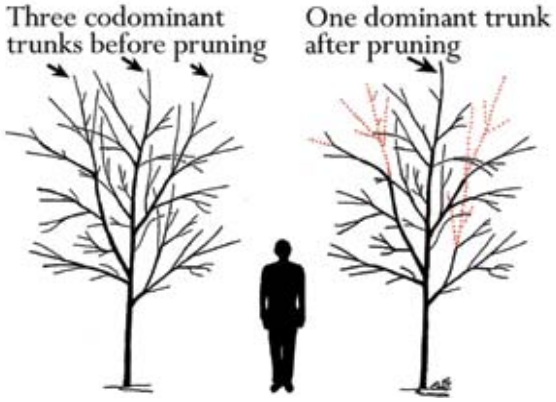

Figure 11. Example of pruning a young tree to develop one dominant trunk.

CONCLUSIONS

Chicora Foundation staff members Nicole Southerland and Julie Poppell visited the tornado damaged Oak Grove Cemetery on March 15 and 16 in order to make an assessment of the property's conservation needs. This work was done at the request of Georgia State Senator George Hooks and the National Trust for Historic Preservation.

As a result of our assessment, we identified 163 monuments and fences that require conservation assistance. Treatment proposals for these items are included in this study as Appendix 2.

Although a great deal has been done at the cemetery using prison labor, **most of these proposals are for very complex conservation treatments**. This work is beyond the capability of laypersons and **requires a stone conservator familiar with cemetery monuments**.

In addition, in order to be eligible for FEMA reimbursement, **FEMA specifically requires that work such as this be done by trained conservators** who subscribe to the Code of Ethics and Standards of Practice of the American Institute for Conservation of Historic and Artistic Works. This is because FEMA recognizes the skill, training, and professional experience required for an appropriate job.

The reliance on conservation professionals will also serve to help **ensure that Oak Grove maintains its listing on the National Register of Historic Places** and remains a treasure to the Americus community.

It is possible that, under the supervision of and using specifications developed by a conservation professional, local masons will be able to make repairs to plot walls.

Our study also provides detailed information concerning the removal of downed vegetation. In particular **we caution that many of the root balls may contain archaeological remains, including human skeletal remains and/or coffin hardware or grave goods.**

Consequently, we recommend that these root balls be inspected by a trained archaeologist. The **City of Americus may wish to contact the Georgia State Historic Preservation Office for additional guidance in this matter**. Failure to examine these root balls may result in the loss of significant cultural remains – as well as the destruction of human remains.

We provide specific recommendations concerning **how the root balls should be removed, once they have been archaeologically inspected. Particular care and caution must be exercised to prevent additional damage to the cemetery.**

Finally, we provide some general assistance in the recovery of the cultural landscape. While we point out that a cultural landscape plan should be conducted for the cemetery to guide long-term landscape issues (such as plantings), **we provide some immediate recommendations on trees to avoid (such as pines and cherry laurels) and trees that might be appropriate for replanting (such as oaks and cedars).**

We also recommend that an International Society of Arboriculture (ISA) certified arborist be retained to evaluate the remaining trees and conduct restoration pruning as appropriate. This certified arborist can also evaluate the standing trees to determine which have a reasonable potential for recovery and which should be removed. Only a certified

arborist is qualified to remove standing trees in the densely populated and historically significant cemetery. This work should not be attempted by untrained individuals, such as prisoners.

The cost for the conservation treatments of monuments is $118,850 excluding travel, per diem, and lodging. The addition of these costs brings the total to $158,200. Also excluded is heavy equipment rental costs associated with a few of the largest stones; we anticipate that this equipment, however, may be provided by the city, avoiding a rental cost.

The 17 Priority 1 stones – those monuments whose current condition is hazardous to the public – have a total cost of $15,000, again excluding travel, per diem, and lodging. Adding these costs would bring the total of Priority 1 treatments to approximately $24,240.

It is also important to point out that conservation proposals are based on the information available at the time of the assessment. As stones are disassembled, additional problems may be identified. The AIC Standards of Practice and Code of Ethics requires that if treatment procedures or costs changes that work be halted and the client informed of the changes in order to obtain approval of the modifications.

We recommend that the conservation treatments begin immediately. Delays will only further endanger the stones, providing additional opportunities for significant portions to be lost or stolen. In particular, those stones with a Priority 1 rating are a hazard to the public and present a liability to the city.

APPENDIX 1. RESUME FOR MICHAEL TRINKLEY

MICHAEL TRINKLEY

Chicora Foundation, Inc.
P.O. Box 8664 • 861 Arbutus Drive
Columbia, South Carolina 29202
803/787-6910

Education/Training

1974	B.A., Anthropology, University of South Carolina, Columbia
1976	M.A., Anthropology, University of North Carolina, Chapel Hill
1980	Ph.D., Anthropology, University of North Carolina, Chapel Hill
1997	Non-Destructive Investigative Techniques for Cultural Resource Management, NPS Workshop, Fort Scott National Historic Site, Fort Scott, Kansas (geophysical techniques)
1999	Jahn Installer Workshop, Cathedral Stone Products, Inc., Jessup, Maryland (3 days) (certified installer 9906811-SC)
2001	Preservation & Care of Brownstone Buildings, Technology & Conservation Conference, Boston, Massachusetts
2003	Lime Mortar Workshop, U.S. Heritage, Chicago, Illinois
2004	Preservation Masonry Workshop, School for the Building Arts, Charleston, SC (2 days)
2005	International Lime Conference, Orlando, Florida
2005	Edison Coatings Workshop, Richmond, Virginia (1 day)
2005	Historic Masonry Preservation Workshop, John Lambert, Campbell Center for Historic Preservation Studies, Mt. Carroll, Illinois (1 week)
2005	Preservation Masonry Workshop, College for the Building Arts, Charleston, SC (2 days)

2005	Masonry Analysis & Testing Workshop, Berkowitz and Jablonski, Campbell Center for Historic Preservation Studies, Mt. Carroll, Illinois (1 week)
2005	Jahn 4-Hour Workshop, Cathedral Stone Products, Columbia, SC
2006	Stone Carving and Restoration Workshop, Traditional Building Skills Institute, Snow College, Ephraim, Utah (3 days)

Memberships

American Institute for Conservation of Historic and Artistic Works
US/ICOMOS – Brick, Masonry & Ceramics Committee
Association of Preservation Technology
Preservation Trades Network
National Trust for Historic Preservation
Association of Gravestone Studies

Abstract of Cemetery Conservation/Preservation Experience (not inclusive of legal/archaeological experience):

1992	Reviewer of National Trust for Historic Preservation publication on historic cemeteries publication by Lynette Strangstad.
1998-99	Principal Investigator, Survey and Documentation of African-American cemeteries in Petersburg, Virginia. Including mapping, grave location, and development of historic context. (with Preservation Consultants, Charleston, SC).
1998-99	Conservation activities, Maple Grove Cemetery, Maple Grove United Methodist Church, Waynesville, North Carolina.
1999	Instructor, Cemetery Preservation: Making Good Choices Workshop, Virginia Association of Museums, Petersburg, Virginia.
1999	Instructor, Cemetery Preservation: Making Good Choices Workshop, Georgia Local History Conference, Augusta, Georgia.
2000	Consultation regarding maintenance and clearing of Ricefield's Woodville Cemetery, Georgetown County, South Carolina.
2000	Invited Speaker, Cemetery Conservation Techniques, Historic Cemetery Preservation Workshop, Maryland Historical Trust, Annapolis, Maryland.
2000	Preservation assessment, Summerville Cemetery, Augusta, Georgia.
2001	Assessment and preservation plan for Glenwood Cemetery, Thomaston, Georgia.
2001	Reconnaissance survey of cemeteries in Richland County, South Carolina.

2001	Preservation guidelines for St. Paul's Cemetery, Augusta, Georgia.
2001	Instructor, Cemetery Preservation: Making Good Choices Workshop, Restoration International Trade Event, New Orleans, La.
2001	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2002-2003	Conservation program, Old Waxhaws Presbyterian Cemetery, Lancaster County, South Carolina.
2003	Treatment of markers at the Vardeman Cemetery, Lincoln County, Kentucky.
2003	Consultation concerning cemetery walls and pathways, Maple Grove Cemetery, Waynesville, North Carolina.
2003	Invited Speaker, Preservation of African American Cemeteries Conference, 2003, Helena, Arkansas.
2003	Instructor, Cemetery Preservation: Making Good Choices Workshop, Washington County, Georgia Historical Society, Sandersville, Georgia.
2003	Preservation assessment, Old City Cemetery, Sandersville, Georgia
2003	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2003	Treatment of markers at Oakview and Riverside cemeteries; examination of burial vaults in white and African American sections, City of Albany, Georgia (FEMA funded).
2003	Preservation assessment, Historic Cemeteries at Five Cemeteries, Bannack State Park, Bannack, Montana
2003	Consultation concerning cemetery brick wall, Midway Church, Midway, Georgia.
2004	Treatment of markers at Richardson Cemetery, Clarendon County, South Carolina.
2004	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2004	Treatment of markers at Maple Grove Cemetery, Waynesville, North Carolina.
2004	Consultation regarding State Historical Marker, Roseville Cemetery, Florence County, South Carolina.
2004	Consultation regarding the Mary Musgrove Monument, Musgrove Mill State Park, Laurens County, South Carolina.

2004	Invited Speaker, Cemetery Preservation Workshop, SC Genealogical Society Annual Meeting, Walterboro, South Carolina.
2004	Treatment of markers at Wrightsboro Cemetery, Thomson, Georgia.
2005	Treatment of markers at Pon Pon Cemetery, Colleton County, South Carolina.
2005	Treatment of markers at Walnut Grove Plantation, Spartanburg County, South Carolina.
2005	Consultant on cemetery fence theft, Save Austin's Cemeteries, Austin, Texas.
2005	Treatment of markers at Richardson Cemetery (Second Phase), Clarendon County, South Carolina.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2005	Treatment of marker in Oakview Cemetery, Albany, Georgia.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Las Vegas, New Mexico.
2005	Treatment of markers at Trinity Cathedral, Columbia, SC.
2005	Preliminary preservation recommendations, Randolph Cemetery, Columbia, SC.
2005	Treatment of markers in Presbyterian Cemetery, Union, SC.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, Save Oklahoma's Cemeteries, Muskogee, Oklahoma.
2005	Treatment of marker, Reynolds Homestead, Critz, Virginia.
2005	Assessment and preservation plan for Lewis Cemetery, King and Queen County, Virginia. King and Queen County Historical Society.
2006	Treatment of markers in Presbyterian Cemetery, Union, SC (second phase).
2006	Assessment and preservation plan for Pine Lawn Memorial Gardens, Aiken, South Carolina. SC Department of Archives and History, Columbia.
2006	Assessment of Unadilla Cemetery, Unadilla, Georgia.
2006	Invited Speaker, Planning a Cemetery Preservation Project, People and Places: South Carolina's Seventh Annual Statewide Historic Preservation Conference, SC Department of Archives and History, Columbia, South Carolina.
2006	Assessment and Preservation Plan, Memory Hill Cemetery, Milledgeville, Georgia.

2006 Assessment and Preservation Plan, Springwood Cemetery, City of Greenville & Friends of Springwood Cemetery, Greenville, South Carolina.

2006 Invited Speaker, Cemetery Rehab, South Carolina Landmark Conference, SC Department of Archives and History, Aiken, South Carolina.

2006 Assessment, Town of Dedham, MA cemetery, Vollmer Associates, Boston.

2006 Assessment and Preservation Plan, Naval Medical Cemetery Portsmouth Cemetery, Portsmouth, Virginia.

2006 Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.

2006 Invited Speaker, Preservation Needs at Greenville's Springwood Cemetery, Greenville Chapter of SC Genealogical Society, Greenville, South Carolina.

2006 Preparation of landscape plan, Randolph Cemetery, Columbia, South Carolina.

2006 Treatment of markers in the Cason Plot, Long Creek Baptist Church, Warrenton, Georgia.

2006 Treatment of markers in the Watson Plot, Thomson City Cemetery, Thomson, Georgia.

2006 Treatment of markers at Trinity Cathedral, Columbia, South Carolina (second phase).

2006 Assessment and Preservation Plan, Old Athens Cemetery, University of Georgia, Athens, Georgia.

2006 Preparation of Treatment Plan, Terrell Tomb, Sparta, Georgia.

2006 Emergency conservation treatment, Settler's Cemetery, City of Charlotte, North Carolina.

2007 Treatment of stones at Laurel Grove Cemetery, Rock Hill, South Carolina.

2007 Assessment and preservation of preservation plans for three city cemeteries, City of Raleigh, North Carolina.

2007 Series of three public presentations, Preserving African American Cemeteries: Practical and Legal Issues. Presented in Charleston, Beaufort, and Georgetown, South Carolina.

National Register Nominations of Cemeteries

1999 Preliminary Multi-Property Nomination, African American Cemeteries of Petersburg, Virginia. Submitted to Virginia Department of Historic Resources, Richmond, Virginia (with Sarah Fick, Preservation Consultants).

2000 National Register Nomination, King Cemetery, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.

2002 National Register Nomination, Scanlonville or Remley Point Cemetery, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.

2005 Preliminary Information Form – Hopkins Family Cemetery, Richland County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.

2007 Preliminary Information Form – Harts Bluff Cemetery, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.

APPENDIX 2. TREATMENT PROPOSALS

Below are treatment proposals for those monuments identified at the Oak Grove Cemetery in need of conservation or repair. These proposals provide a photograph of the stone, fence, wall, or other monument in question; the monument's current condition; information concerning the nature of the intervention recommended; the priority assigned the treatment; and the approximate cost of the treatment.

As explained in the body of the report, the priority recommendation is based on five levels of need:

1. Objects that are a threat to the public or in immediate threat of failure – examples include those that are unstable and in danger of falling. In these cases delayed treatment poses a risk to the public and a liability to the University. We recommend treatment within the current fiscal or calendar year.
2. Objects are a threat to themselves – examples include unstable monuments that, if ignored, will continue to deteriorate with the result that within 5 years the cost of repair will be significantly greater than the cost over the next 1-2 years.
3. Objects that require attention and deterioration is ongoing, but where delay for 2-5 years will not significantly harm the object and will present no threat to the public. Examples of this category include stones where the damage is primarily aesthetic.
4. Objects appear stable at present, but they should be re-inspected in 5-10 years to determine if the condition has changed.
5. Irreparable. These objects have either suffered so much damage or have so much fabric that repairs are not possible using available techniques.

The costs identified are based on the treatment being carried out by an AIC stone conservator, the minimum credentials that should be demanded by the City. The costs are based on 2007 salary rates and supply costs. It would be reasonable to add a minimum of 8% additional per year delay beyond 2007 (although some costs, such as chemical supplies, are escalating far more rapidly). The costs do not include travel, per diem, or lodging since these fluctuate dramatically and since the per object cost declines as more treatments are proposed.

All information given and recommended in the treatment proposals is based on our research and is believed to be accurate. However, no guarantee, either expressed or implied, is made with respect to the proposals. As stones are taken apart it is possible to discovered hidden damage.

Cemetery Preservation Plans

Historical Research

Identification of Grave Locations and Mapping

Condition Assessments

Treatment of Stone and Ironwork

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